Mettauer (J. P.)

A MEMOIR

ON

STRICTURE OF THE URETHRA,

BY

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To THOMAS D. MUTTER, M. D., Professor of Surgery in Jefferson Medical College, Philadelphia.

My Dear Sir:

Although personally unknown to you, I have taken the liberty of inscribing to you this Memoir on Stricture of the Urethra. The distinguished position you now occupy as a Surgeon, and Teacher; your important additions to our stock of Surgical knowledge; the disinterested and magnanimous liberality you have always manifested in awarding merit to your brethren; to say nothing of your Virginianism, and elevated character as a gentleman, justly entitle you to my confidence as the patron of this contribution to Surgery though humble it be.

Like yourself I have devoted the best energies of life to my profession. The subject treated of in this paper has ever been one of absorbing interest with me; and my early attention was directed to its deliberate study, because I regarded it as imperfectly understood by the profession, although of paramount importance to life and its comforts.

I do not know that you will approve of the doctrines and modes of treatment I have advocated; but I am sure they will not be hastily rejected by you. And if they prove as useful in your hands, in mitigating human suffering, as they have uniformly done in mine, I dare believe you will both approve of, and adopt them.

Wishing many years may yet be added to your useful life, I I take much pleasure in subscribing myself your fellow citizen, and friend, most faithfully.

JNO. P. METTAUER.

Medical Department of Randolph Macon College, Virginia, April 28th, 1849.

PREFACE.

In preparing this memoir, the design is not to present a complete history of stricture, nor of the methods generally in use for its cure. The object, contemplated, is merely to exhibit the modes of operating adopted by myself, with an account of the instruments I have generally employed, some of which are original with me as far as I know to the contrary. Nor is it pretended that I have advanced new principles for the treatment of stricture. All that I claim under this head is the application of long established ones, in somewhat a new light, making them conform in some degree to the improvements of surgical principles of the present enlightened age.

As far as the history of stricture extends I believe it is correct, as extensive personal intercourse with the disease has mainly contributed the facts from which it is drawn: it is however brief.

The modes of operating, as well as most of the instruments I have employed, were adopted, now more than twenty years since. In only one or two instances have I derived a hint from my predecessors, or contemporaries in the construction of my instruments. It will be perceived that I have adopted the idea of Dr. Physick's stricture lancet, in the formation of the one I employ; though mine differs materially from the one employed by that distinguished surgeon. I also employ sounds for the exploration of stricture, formed upon the plan of Sir Charles Bell's 'balls,' for the same purpose.

In conclusion, I will state, that this memoir is a compendious abstract of my individual experience, in the treatment of strictures of the urethra, and it is only presented to the medical profession as such.

Medical Department of Randolph Macon College,
Prince Edward C. H., Virginia, April 28th, 1849.

INTRODUCTORY HISTORY.

Stricture, in its early stages, is liable to be confounded with other diseases of the genito-urinary organs, and is often obscure and difficult of detection at this period of its existence. Sometimes the urethra has been supposed to be the seat of irritation, and the disease produced by it regarded as a form of stricture, which, finally turned out to be only a sympathetic affection of the urethra. Neuralgia, rheumatism and dyspeptic seminal weakness are affections of this kind: they simulate stricture in some instances, but when the primary diseases are relieved these affections also disappear from the urethra: even muco-purulent discharges from the urethra may accompany these sympathetic irritations, and lead to a suspicion that some form of urethritis exists. Such discharges however, should always be regarded with attention, as they often indicate something more than mere sympathetic disturbance of the the mucus lining of the urethra; and in many instances they are the attendants of stricture. Stricture itself, occasionally results from such irritations translated to the urethra, and in a form to to cause intense suffering from the attendant pain. It is not determined in the present state of our knowledge, whether most of the cases of stricture are not the product of sympathetic irritations translated to the urethra. Certain it is, that many examples of the disease have been met with, which could not be traced to a local cause operating directly on the urethra; and when stricture has followed the action of such a cause, its appearance has generally been observed to take place at a period more or less remote from its application to the urethra. The causes of stricture are by no means clearly ascertained, with the exception of the improper application of the nitrate of silver to the mucous lining of the urethra, some examples of urethritis impurus, and ulcerating and other wounds of the walls of the passage; and in these cases the stricture forms slowly, in most instances, seldom appearing for weeks after the operation of such causes. Even when gonorrhœal irritation seems to induce stricture, it follows at a period quite remote from the subsidence of that disease. In some instances the stricture has not made its appearance for ten years after the cure of gonorrhœa. In a majority of the cases of stricture treated by myself, the disease has come on slowly and insidiously; and urethritis impurus has seemed to have been its most frequent remote cause. Gleet, too, has occasioned it, especially when of long standing, or when often re-excited by imprudent exertion of the muscular powers. With carpenters and other laborers, who exert

the muscles of the back much, and in prolonged efforts, stricture is very liable to occur.

An occasional cause of stricture is likewise to be found in disorders of the digestive function. I have met with it in connection with dyspepsia, constipation and diarrhœa. The disease is prone to induce these conditions; and dyspeptics are peculiarly liable to stricture.

Few patients notice the earliest symptoms of stricture unless they are violent, which, in a majority of instances, is not their character; and hence it is, that the disease is not particularly attended to, until it has made considerable progress. An individual may labour under a confirmed stricture, and be unconscious at the same time that the urine does not flow in as bold a stream as usual, by reason of the slow and gradual formation of the contraction of the urethra. Stricture may exist, too, quite extensively, without materially affecting the size or force of the stream of urine, while the general health is sensibly impaired by it. A stricture can even exist for years, without diminishing, or enfeebling the stream of water, so as to arrest the particular notice of the patient. The diminution, or enfeebling of the stream, however, or its complete interception, belong only to the worst cases; and very soon after those changes take place, patients are compelled to give especial attention to their condition, as they are accompanied with bodily suffering, and mental anxiety in greater or less degrees of intensity.

VARIETIES OF STRICTURE.

There are three kinds of stricture: *The Spasmodic; The Mixed;* and *The Organic—True*—or *Permanent. The Spasmodic* variety consists in a convulsive condition of the urethra, more or less suddenly induced, which not unfrequently closes the passage so completely as to produce retention of urine; and the spasm may be confined to a particular portion of the urethra; or can occupy its whole extent. In some instances I have met with spasms so violent, as to resist the introduction of a bougie, or the catheter many hours; and when the contraction was gained by the instrument, it would be so firmly embraced as to produce intense pain in the part, and also to render its removal difficult, without the employment of considerable force. Generally, this variety of stricture is variable and transitory, relaxing and exacerbating frequently, especially when the bowels are easy, or constipated; and when the bougie or catheter is withdrawn, or introduced. In an especial degree, this affection is liable to appear under its most dis-

tressing form with intemperate eaters, or wine bibers; and with dyspeptics. Individuals of rheumatic and gouty aptitudes are, also liable to it in violent forms. Most of the cases of retention of urine, suddenly induced, result from spasmodic stricture. Frequently repeated, this form may, and often does produce permanent stricture.

The Mixed variety is distinguished by a congested state of the parts affected with spasm, manifested by a remarkable disposition of the urethra to effuse blood, during attempts at cotheterism, and occasionally without such attempts; as well as by preternatural fullness of the seat of the contraction; to be discovered between the fits of spasm, both with the catheter, and, externally, in some instances, by pressure along the course of the urethra with the finger. There is also a mixed variety, complicating the permanent form of stricture, consisting of the varieties which have been described, and the mutations of structure peculiar to it. An example of ordinary mixed stricture is to be met with, in nearly every variety of urethritis. Masturbation; excessive indulgence in "wine and women;" hard rides on horseback; and repeated attacks of the spasmodic, are some of the causes of this variety; and it is the form of the disease most liable to end in permanent stricture.

Organic, or *Permanent Stricture* consists in fixed contraction, or narrowing of the urethral passage, the result of thickening of its walls. It is by far the most difficult variety to understand, as well as to treat; and, must interest the profession correspondingly, and profoundly too. This form of the disease has its seat in the mucous and submucous textures of the urethra, seldom if ever involving the muscular or other structures of its walls, unless rupture; ulceration; or ordinary wounds are its causes; and it is induced by the deposition of coagulable lymph, either beneath the mucous lining, without implicating the submucous textures; or involving both of these structures. The lymph becoming organized, gradually thickens the walls,—the urethra in the same ratio becoming swollen,—inelastic, and incapable of dilatation. In nearly every instance, these pathological charges are due to irritation set up in the parts affected, by some of the causes which have been enumerated; and the whole process is unquestionably a form of sub acute inflammation, such as doubtless attends upon scrofula, and many examples of hypertrophy, in which lymph is also effused and organized, so as to change the forms as well as the anatomical conditions of the organs in which it takes place. That this form of stricture depends on thickening of the walls of the urethra, is placed beyond all doubt by the numerous operative dissec-

tions, and examinations, which I have carefully made, during my long intercourse with the disease. In a majority of cases, especially those of long standing, there was both thickening and induration of the walls of the urethra; and now and then the indurations were almost of cartilaginous hardness. The thickenings, however, were not of equal extent; nor did they impart to the urethral mucous surface the same form in every instance. Sometimes they were confined to a very limited portion of the canal. Now and then they occupied only one of its sides. In some instances one contraction existed; while in others several were met with, and occasionally in close proximity. The contractions, or rather the narrowings of the urethra, depended more on a protrusion of the mucous lining into the cavity of the urethra, than actual contraction of its caliber; and this state of the lining membrane was due to the deposition of coagulable lymph beneath it, which had become organized. Occasionally, several of these projecting thickenings of the mucous lining were to be met with, but so disposed along the canal as to change its axis, and to render the passage of the bougie difficult. In a few instances, the urethra was found obstructed by a kind of diaphragm situated nearly transversely, with openings, sometimes through the centre, and now and then on one side, and formed of the reduplicated and prolonged folds of the mucous lining.

With the exception of the cases produced by wounds, ulceration, &c., I have only been able to detect the two kinds of permanent stricture just pointed out, with their modifications, which are the admitted varieties of the disease, according to systematic writers.

Organic stricture is slow in its formation and progress; but after it once commences tends continually to augment, even when not irritated by incidental causes. It is very liable to be aggravated by other diseases. In an especial manner, catarrhal affections are disposed to aggravate it. Disorders of the digestive system likewise materially affect it. Improprieties of diet, riding on horseback, undue exercise of any kind, and, occasionally, sexual indulgence, I have also known to aggravate it, and in some instances suddenly and violently.

Nearly every portion of the urethra, according to my experience, is subject to stricture, as already remarked; but I have most frequently met with it at the bulb, the prostatic extremity of the membranous part of the canal, and the orrifices of the fossa navicularis. About two-thirds of my cases had their seats at or near the bulb. Fifty-one cases were attended with contractions at the bulb, and anterior extremity of the prostate; and 118 in which

the strictures occupied the posterior orifice of the fossa navicularis, the bulb, and posterior extremity of the membranous portion of the urethra at the same time. In 182 cases which I have treated, and successfully, only 16 instances of the diaphragmatic, or as usually termed, the bridle variety, were met with; and these occurred at or near the orifices of the fossa navicularis, or in the spongy portion of the urethra beyond the fossa.

The Symptoms of Stricture: and first of the *Spasmodic, and Mixed Varieties.* The most prominent symptoms of Spasmodic stricture are pain, and a peculiar tight feeling in a particular part of the urethra, attended with more or less difficulty in the passage of the bougie, and a constant disposition to grasp the instrument, attended with retention of urine, and restlessness. The pain is occasionally severe, especially after passing the bougie, and remits and exacerbates frequently. Painful erections are sometimes present. The symptoms of Mixed stricture are more or less pain of the urethra,—tumefaction, tenderness, hardness, imperviousness of the affected part of the canal, and a remarkable disposition of the lining membrane to bleed.

The Symptoms of Permanent Stricture may be distributed under the heads of *Constitutional* and *Local.*

Constitutional Symptoms. One of the earliest symptoms of this class, is depression of spirits, which is soon followed by disinclination for business, and a desire for solitude. Nearly simultaneously the digestive system suffers disorder, manifested by constipation, anorexia, and frequently acidity of the stomach. Not unfrequently the individual complains of debility; and early after this, begins to emaciate and turn pale. Disturbed sleep, too, is an early attendant; and frequently dreams of a most unpleasant character add to the patient's nocturnal disquiet, particularly polluting dreams. As the disease augments most of these symptoms become aggravated. In an especial degree the dyspeptic and nervous symptoms augment in intensity: and now it is, that a disposition to chills, or rigors is generally felt for the first time.

These symptoms are not necessarily indicative of the existence of stricture, nor are they even peculiar to it, but are common to that disease, as well as other disorders of the genito-urinary organs. Patients themselves seldom refer them to stricture, but are disposed to ascribe them to some form of the venereal disease. Even physicians do not always regard them, at first, as the constitutional symptoms of stricture, but are more inclined to refer them to dyspeptic disturbance, or spinal irritation, or to hypochondriasis.

In a remarkable degree, individuals affected with this form of stricture, are liable to catarrhal disturbances. Some of the cases

which have passed under my treatment, were distinguished by an abiding catarrh, that only abated with the cure of the stricture. Pain of the back, or weakness, not unfrequently termed weariness by patients; pain of the hips, groins, along the insides of the thighs and knees, is also often an attendant. In some cases, too, the testes become painful, swollen and tender. Smarting or burning sensations are often felt in the glans penis, or along the penis itself, which, occasionally extend to the fundament. Troublesome erections of the penis, especially during sleep, with or without seminal emissions; or the erections are entirely deficient—are also often present as symptoms. The urethra itself is often affected with pain, itching, sensations of heat and throbbing. An increased secretion of urine, or the frequent desire to void it, without an increase in the quantity secreted, also often attend. The qualities of the urine are likewise materially changed. Even a disposition to calculous formations is often an attendant of stricture. And these symptoms progressively increase in intensity as the disease advances.

Local Symptoms. The earliest appreciable symptom under this head is a forking, or unusual twisting of the stream of urine. Very soon, however, after the stricture commences, the force as well as the size of it is perceptibly diminished; and with such changes of the stream, post urining dribbling is generally associated—one of the most anoying symptoms of the disease. Individuals, too, can generally discover in the early stage, a slight puruloid discharge from the urethra, especially when pressure is made along its course towards the meatus. This discharge, however, is not always to be met with; and in some instances it is only mucus slightly changed. As the stricture increases in closeness, the stream lessens in size, as well as weakens in force, but retains the forked or twisted appearance, or becomes scattering.

When the stricture is below the bulb, the stream is more bold than if situated at or near the orifices of the fassa navicularis. The nearer it is to the meatus, the more feeble will be the force of the stream. Even in very close strictures, the stream will be bold in proportion to their depth in the urethra. Generally, however, the stream is small and feeble in these examples.

It is when the stricture becomes very close, that patients experience occasional temporary interruptions to the flow of urine, amounting in some instances to retention. In most of these cases, the obstruction is due chiefly to spasm, or temporary engorgement of the strictured parts, and not to actual closure of the stricture itself induced by constipation, diarrhœa, imprudence in eating or drinking of ardent spirits, the use of stimulating diuretics, riding

on horse back, variable temperature, sexual intercourse, or whatever may tend to irritate the urethra. Most commonly in this stage, the puruloid discharge becomes more copious, and it is sometimes confounded with the discharge of gonorrhœa. Nocturnal emissions, too, are more frequent, and are generally attended with more or less pain; and, occasionally, with blood. Frequently during the emission, the semen regurgitates upon the bladder, and is discharged afterwards with the urine; and these regurgitations are most apt to take place when the stricture is seated near the prostate gland. Coition is commonly attended with pain, or a sensation of uneasiness, especially at the moment of emission, or immediately after it takes place. I have known individuals affected with very close stricture, to suffer acute pain at the moment of emission, followed by smarting and stinging sensations, and ardor urinæ, which continued for one or two days. The most prominent symptoms of this stage, however, are the small, feeble, or dribbling stream of water; and the lengthened time required to evacuate the bladder, after becoming filled with urine. But, after all, difficulty, or impracticability in penetrating the stricture with sounds or bougies; and the impressions left upon the waxen bougie after passing and remaining in the strictures a short time, furnish the least equivocal signs of the existence of stricture, of the kind now under consideration.

Lesions Constituting Stricture. These are found to exist under several different forms, such as thickening and induration of the walls of the urethra; brides or bridles; and engorgement of the capillaries of its mucous and submucous textures. *Thickening*, and more or less *Induration*, however, are the lesions usually met with; and to them the term permanent stricture is most properly applicable, as, in truth, no other form is attended with an abiding contraction or diminution of the urethra. In some instances the indurations acquire almost a cartilaginous hardness; and, by every degree of this degeneration of structure, the elasticity of the urethra is impaired more or less. The mucous lining of the urethra is also changed in its secreting function, so as to render it dry to some extent, which causes difficulty in the passage of the bougie, or catheter, and very often subjects it to the painful action of the urine during urination. In no case have I been able to detect material change of structure, in any of the textures exterior to the submucous, except when rupture, incision or ulceration had implicated the entire walls of the urethra. As the thickening increases, the mucous membrane at the part affected is forced into the canal which it lines, so as to narrow its caliber, and, finally, to close it completely. In some instances the contractions, or thickened portions are an inch in extent, and lobulated.

The form termed *Bridle Stricture*, differs from the preceding. Indeed, in strict propriety of language, it is not stricture of the urethra, but obstruction of its canal, while the caliber is little if at all contracted by it. The lesion of this variety is confined chiefly to the mucous lining; and seems to result from prolongation of it, connected with relaxation and subacute phlogosis.

Brides are most frequently met with at or near the orifices of the lacunæ, and of the fossa navicularis. They are occasionally met with too, in the vicinity of the bulb, a little anterior to the corpus spongiosum. Where ever situated they consist of a thin valvalor fold, or septum, projecting into the urethra; and they may take a position in the canal either transverse or longitudinal. The former however is the most common; and it can attach itself to every part of the corresponding wall; or only to a particular portion, or to one side of it.

These brides obstruct the flow of urine more or less, and at the same time prevent the dilatation of the walls of the urethra, and thus bridle or restrict them. They are perforated; and the opening may be central, or to one side. Occasionally they are to be met with on one side, to which the bridle has its attachment. It is probable, in some instances, that they are the product of an elongation of the folds of the mucous membrane, constituting the valves of the lacunal orifices, changed by chronic inflammation. They are always of limited extent, and of delicate organization.

The transverse brides invariably reduce the size, and enfeeble the stream of urine; while those situated longitudinally render it forked or twisting. In some instances the transverse brides close up the urethra completely, producing retention of urine; which, however, is never the case with the longitudinal; yet they may greatly reduce and embarrass the stream.

Engorgement of the Capillaries, of the Mucous and Submucous Textures of the Urethra, often coexists with permanent stricture, and when present never fails to augment the contraction. It is engorgement of the capillaries, which frequently renders a close stricture impernicious to urine, and thus suddenly, in many instances, causes retention. Under ordinary circumstances it coexists with stricture, too, as a necessary concomitant of the disease; and its presence will enable us to account for the very free discharge of blood, occasionally, without any known cause, in cases of stricture; and also for the hemorrage, sometimes free, during gentle efforts in the sounding of stricture.

This lesion is occasionally attended with a spasmodic disposition of the urethra, anterior to the stricture, as evidenced by its firm grasp of the sound, in some instances, after remaining in contact with the stricture a few moments.

Strictures of variable character, some times close and then not, and disposed to yield blood from gentle exploring trials—or spontaneously, with preternatural sensibility of the urethra, and redness and pouting of the meatus, may be regarded as complicated with engorgement of the capillaries of the parts involved immediately and remotely in the stricture, and as presenting an example of this lesion.

Lesions Consequent on Stricture. These are numerous and diversified, and add greatly to the importance of stricture; nay they constitute its chief and absorbing interest in a majority of instances.

Dilatation of the Urethra Behind the Stricture. This lesion is of frequent occurrence, and results from repeated over distention of the urethra, during efforts of the bladder to expell its contents through a close stricture. These dilatations may occur in any part of the urethra, and be situated either behind or before the stricture, and more or less remotely from it. I have met with them more than two inches from the contraction. Now and then several of them exist at the same time. Even the prostatic portion of the urethra is sometimes their seat, and then the prostate becomes wasted, and the orifices of the seminal ducts opening into that portion of the canal, are generally dilated, or elongated, or transformed into carunculous formations. When situated in the posterior part of the prostate, so as to involve the neck of the bladder, the mucous follicles of it are also dilated to a considerable extent.

The dilatations are in some instances of large size—becoming pouches; and they often contain sabulous, nay sometimes calculous deposits; and always cause mucous, or muco-purulent discharges from the urethra.

Rupture of the Urethra Behind the Stricture. This lesion may take place without or in connection with ulceration of the urethra; and it is always preceded by, or attended with inflammation of the textures involved. After a slight breach is formed in the mucous lining of the urethra by ulceration, the walls readily give way under the pressure of the bladder, in efforts to expell the urine; and the same thing takes place more easily, when the parietes of the urethra are inflamed to the extent of softening them—a condition often induced by the repeated expulsive efforts of the bladder in close stricture, when urine accumulates in considerable quantity. These openings are of variable form as well as of extent. Sometimes they are round, ovate or a mere fissure; and their direction is equally variable, being longitudinal or transverse, or in the diagonal of the urethra. They open into the cellular

texture of the urethra exteriorly, as well as that of the perineum and parts contiguous, when they occur below the bulb; and into the corpus spongiosum urethræ, or one or both corpora cavernosa when they form above it. When they take place, urine escapes into the loose textures into which they open, attended with more or less effusion of blood.

This accident, although formidable in its consequences, and somewhat painful at the moment it occurs, generally affords relief, by evacuating the distended bladder.

Infiltration of Urine. This is to be regarded as one of the most terrible lesions consequent upon stricture. The escape of urine into the cellular texture of the penis, scrotum and perineum, could not fail to be productive of troublesome consequences, such as low depressing fever, and often extensive sloughing of the infiltrated structures. In some cases the loose textures of the perineum and scrotum—nay even the prostate, bladder and rectum have been completely disorganized, and have sloughed away, in consequence of urinal infiltrations from rupture of the urethra in stricture; leaving the unfortunate sufferer, if life was spared, a mutilated being, which no art could correct. Infiltration more frequently, however, is followed by inflammation and its consequences, suppuration, and induration of the structures involved. In some cases, the textures are transformed into degenerations of nearly bony hardness, and in a degree deprived of their normal sensibility. When abscesses form, they generally open externally, and discharge a mixture of pus, urine and blood; and the openings, if not soon closed, become fistulous, through which the urine continues to escape, if their corresponding sinuses communicate with the urethra.

Sacs in the Urethra.—Sacs of variable size and number, frequently form in the urethra, as lesions consequent on stricture, especially in the membraneous portion of the canal. These sacs are lined with the mucous membrane of the urethra; and although they greatly annoy the patient by the post urining dribblings they cause, they yield no discharge, and are not a source of pain or danger to the individual.—They are produced, in all probability, by repeatead and more or less powerful contractions of the bladder, in forcing urine through the strictures; and sacs are formed instead of dilitations, because the walls of the urethra are comparatively free from inflammation, which enables them, in a degree to resist the contractions of the bladder.

Lesions of the Urethra Anterior to the Stricture.—The urethra, anterior to the stricture, is liable to become inflamed, and to undergo important changes in its organization. In some instances the urethra is inflamed on both sides of the stricture, and nearly to the same extent. When this is the case, the urethra becomes dilated on the proximal side of the stricture, if the disease has existed sometime; while there will be more or less contraction of it on the distal. In some instances the contraction is very considerable, almost causing obliteration of the urethra. The walls are likewise thickened, and the urethra can be felt, in consequence of it, decidedly indurated for an inch or

mere. When of long standing, these changes of the urethra nearly destroy the elasticity of its walls; and if restored, much time will be required in the use of proper remedies to accomplish the cure. These contractions occasionally embarrass the treatment of strictures with which they are associated, and always render catheterism difficult.

Lesions of the Prepuce and Glans Penis.—Inflammation of the prepuce, and glans penis occasionally occurs as the concomitant product of stricture, and in some instances to the extent of producing paraphymosis. This is apt to be the case when the prostatic portion of the urethra, or neck of the bladder are the seats of strictures producing the primary irritation. In some instances the glans becomes greatly enlarged, assuming a preternaturally red and nodulated appearance, inducing, at the same time, paraphymosis. Even the penis itself in some cases, acquires unusual development, becoming elongated, hard and rigid, and permanently so, until the stricture is relieved: and these lesions may greatly embarass the treatment.

Lesions of the Testes.—The testes often become painful, tender, inflamed and swollen from the irritation of stricture, especially when seated near the prostate, or within the portion of the urethra which traverses that organ. When the lesion is decidedly inflammatory, it adds much to the sufferings of the patient; and the earliest attention to it is demanded. In some cases, too, the treatment of stricture will induce like conditions of the testes, especially the frequent introduction, or, the continuance of the bougie, or tube in the urethra. Sometimes exercising too early after treating the stricture, will produce like effects, of which I have witnessed many examples. Independent of the pain and inconvenience connected with these lesions, they are important by reason of their tendency to produce incurable disorganization of the fecundating powers of the testes. In every form of them, they oppose insuperable impediments to the treatment of stricture for its radical cure. Invariably, these affections should be relieved, before an attempt is made to operate for permanent stricture, unless the case be complicated with retention of urine.

Lesions of the Prostate.—Unless seated in the prostatic portion of the urethra, or very near the prostate itself, stricture does not necessarily subject that gland to lesion of structure. In advanced age enlargement of it is so constant, that when stricture occurs in connection with it, we are to regard the coincidence as accidental, and not a necessary concomitant of the stricture, unless the gland, or parts in near proximity are its seats. In some of my cases of stricture, with young subjects involving the prostate, I

have found the gland decidedly enlarged, but in most of these examples the organ regained its normal size after the cure of the stricture. Even with the older description of patients, I have found the removal of the stricture, to be followed by very marked reduction in the size of the prostate; going to show that stricture in certain cases tends to the enlargement of the prostate gland. I have never met with a case of enlarged prostate, with the younger description of patients, when the stricture occupied a seat remote from that organ.

The most important lesions of the prostate, referable to the irritation of stricture, are its wasting and dilatation, connected with expansion of the urethra, and abscesses of the gland; and these seem to follow more directly from the expulsive efforts of the bladder, in partial retention of urine, than from the irritation of the stricture. These lesions of the prostate, in greater or less degrees, add to the difficulties in treating stricture for its radical cure.

Lesions of the Bladder.—The bladder often becomes expanded and thickened in its walls, from repeated efforts to expell its contents through a close stricture. Cysts of considerable size, also form in the walls of the bladder from a like cause, forcing the mucous lining between and beyond the muscular network of the vesical walls; and they are most liable to occur near the fundus of the bladder. These cysts occasionally become the depositories of sabulous matters, and sometimes of calculi of large size.

When the walls of the bladder become greatly thickened beyond their normal state, and unequally so, they generally experience, at the same time, impairment of their contractile powers in some degree, manifested by more or less inability to expell the urine.

In some instances, too, a morbid impressibility of the mucous lining of this organ is imparted to it, by its unequal action, in efforts to expell urine through a close stricture, which renders it intolerant of urine, and causes much suffering. Now and then the reverse is the case, and prodigious accumulations take place without uneasiness, or even the desire to urine. These lesions never fail to augment the difficulties in the treatment of stricture, and in some cases render its cure impracticable.

Lesions of the Ureters and Kidneys.—In cases of stricture of long standing, and of grave characters, the ureters and kidneys are often involved. The ureters become dilated, and their walls thickened. The kidneys are occasionally enlarged, and otherwise diseased. Suppuration and gangrene have been met with, as lesions of these organs, in fatal cases of stricture. In a majority of such instances, when retention is not the cause of death,

lesions of the kidneys induce it by preventing the elimination of urea from the economy. In some of these examples, the breath exhales a strong urinous odour, which is usually preceded by delirium or paralysis, or both; and the secretion of urine is completely suspended.

Album in uria is occasionally a concomitant lesion of the kidney in stricture also, but it is more frequently the result of seminal weakness, connected with prostatic irritation; and they so impair the constitutional health, as to augment the difficulties greatly, in the treatment of the attendant stricture.

Lesions of the Rectum. In many cases of close stricture of long standing, *Prolapsus Ani* is to be met with. In some instances there is a disposition to it from the commencement of the stricture.

Hæmorrhoidal Tumours, also, frequently make their appearance in connection with stricture, and are, like prolapsus ani, the result of frequent strainings, during prolonged efforts to expell urine through a close stricture. In one case the hæmorrhoidal affection resulted in fistula in ano, which greatly augmented the patient's sufferings, as well as the difficulties in treating the stricture. These complications should always be carefully attended to, as preliminary to the treatment of the stricture.

Lesions of the Loins.—Pain of the back, in distressing degrees, is not, by any means, an unusual attendant of stricture. In some instances the pain extends to the hips, and even to the scapula, nape of the neck and head. This attendant is most commonly met with, when the prostate, or urethra near it, are the seats of the stricture. It greatly disquiets stricture patients, when confined to bed during the after treatment; and if possible, should be relieved before commencing the treatment for the radical cure of the stricture.

EXPLORATION OF STRICTURE.

The exploration or sounding of strictures can be most easily accomplished with the *Ball-Probe* figured at the end of this memoir. *Waxen Bougies* may also be employed, and when the strictures are not very close, answer pretty well. The ball-probe, or stricture sound, should always be used in the first exploration with the largest globe, and the different sizes tried in succession, until the stricture is penetrated, or is found too close to allow either size to pass it. For this operation the patient may lie on his back, sit, or stand. The recumbent posture, however, is most favourable; and the body should be so placed, as to relax as far as possible, the muscles of the perineum. A moderately dark

room, perfectly quiet, and the temperature so regulated as to be agreeable to the patient, will essentially promote the success of the operation. The urine should be allowed to accumulate for some hours before sounding is attempted, especially in close stricture, and if there is much difficulty, the passage of the sound will sometimes be facilitated by the expulsion of a few drops of urine from time to time, while the globe is pressing against the contraction. An easy soluble state of the bowels ought invariably to be secured, as a preparatory step to sounding, in all cases of stricture, but more especially in the closer examples of the disease.

The position, which I have generally preferred in difficult cases, is the recumbent, the patient resting on the back, with the thighs flexed on the pelvis, and the legs on the thighs—and on a table or narrow bed of convenient height. Standing or sitting, as may be most convenient, on the right side of the patient, the sound, previously oiled, and warmed if the season is cold, held by the operator's right hand near the handle extremity, while the penis is conveniently grasped and supported by the left, is to be gently entered at the meatus, and its globe or probe extremity carefully carried down to the bulb, by a probing searching motion. This step may be accomplished with the convexity of the curve of the instrument to the perineum, or to the symphisis as may be preferred by the operator. The latter I invariably adopt, and believe, after becoming accustomed to it, operators would generally prefer it. After reaching the bulb, the probe extremity must be directed backwards and a little upwards, supposing the convexity to be looking towards the perineum. But if the reverse is its position, the direction of the probe-extremity of the sound may be varied, and made to pursue the course above indicated, simply by reversing the convexity—in turning the instrument without removing it from the urethra—taking care, however, that the version does not cause the globe extremity to recede from its position in the bulb. Should a stricture exist anterior to the bulb, the sound may also be introduced according to these methods; and, generally, it will be safest to make trial of both in such examples, to guard against the possibility of error. After reaching the stricture, the globe extremity of the sound should be gently pressed against it, and in the axis of the urethra, but with a moderately increasing force, to be continued for some moments. Should the trial prove ineffectual, the probe extremity must be slightly retracted, and again carried forward against the stricture, but its direction must be varied somewhat. In this manner the operation should be continued, taking care to vary the direction of the sound, until a sufficient trial may be supposed to have been made

with the first globe; and in like manner each size must be tried in succession, until the stricture is gained, or proves impenetrable. Should one stricture be passed, the instrument must be carried through any others that may exist, quite into the bladder.

Having passed the stricture or strictures, the sound may be withdrawn; but before the globe repasses the contraction, its shoulders must be made to press against the proximal surface of it; and, by allowing the penis to contract upon itself, and carefully sliding the moveable gage down to the verge of the meatus, we are enabled to ascertain the exact depth of the inferior surface of the stricture. The globe may now be carefully drawn through the contraction and then gently pressed back against the superior or distal surface; and if the penis be again allowed to contract upon itself, the extent of the stricture will be pretty well indicated by the space between the gage and the verge of the meatus. The gage may now be pressed down to the verge of the meatus, which will also show the distance of the anterior surface of the stricture from the extremity of the penis. In this manner each stricture may be explored, and its depth in the urethra ascertained. When the exact form is to be ascertained, and especially if the stricture is not very close, the waxen bougie will be required. This instrument must be of a size to pass the stricture with some difficulty; and must, after being oiled and curved if necessary, be introduced with a gentle but firm onward movement down to the stricture. If seated anterior to the bulb, it will not be necessary to curve the bougie; but in all cases, where the contraction is below that region, it should be somewhat bent near the entering extremity. The bougie should be pressed gently but steadily, and with rather a quick motion against the stricture for a few moments; and if it does not pass, it may be slightly withdrawn, and again pressed forward, but with its direction varied; and these trials should be repeated until the contraction is penetrated, and fairly passed by the instrument. I have generally succeeded best with the bougie while the patient was in the erect posture; and for many years have been in the practice of adopting it, especially when the waxen bougie was used, to prevent its being broken, as well as to be enabled to introduce it more readily. After gaining the stricture the penis may be allowed to contract upon itself, and the bougie be permitted to remain for at least twenty minutes. It may then be withdrawn, but before doing so, at the orifice of the meatus, it should be marked with the thumb nail. It may now be gently withdrawn, and by inspecting it, the form, extent and depth of the stricture in the urethra will be indicated by the impressions formed on it. In many ca-

ses, the stricture cannot be penetrated by the bougie, not even those of small size; and I have met with, and treated numerous examples of the disease, without having ever penetrated them with either of the instruments I have been noticing. For a number of years, I have in a great measure, dispensed with the critical exploration of stricture, believing it a needless refinement in the diagnosis of the disease; and after twenty years' experience, I have not regretted it. It certainly saves patients some bodily suffering, and not a little mortification from exposure of their genitals. The only exploration I now make, is that which enables me to determine that stricture certainly exists, and that it is of close character. There is a description of stricture, however, which requires great care and precision in the exploration, to enable us to determine the precise character, as an indispensible prerequisite to successful treatment. In these examples—which are the different varieties of bridle stricture—an active surgical treatment can never be safely attempted, until their true character has been ascertained by exploration. It may be remarked, that the exploration in these strictures is a most delicate operation, by reason of the slight changes induced by them in the urethra; and the globe stricture-sound is the only instrument which can be usefully employed for the purpose.

Treatment of Stricture; and first of the *Spasmodic Variety.* This should be constitutional and local. The Constitutional Treatment, in many cases, requires only such measures as tend to regulate the bowels, and promote secretion generally. Occasional *mild cathartics* will prove highly beneficial, especially if the liver and bowels act imperfectly. In some cases, mercurials will be demanded to improve the condition of the liver. With a like intention, the Nitro-Muriatic Acid Mixture may be employed with great benefit, by reason of its tendency to stimulate secretion generally, but more particularly that of the liver, and gastro intestinal mucous lining.

Bloodletting may sometimes be demanded, should there be much general fever, attended with a firm and strong pulse, and hot and dry skin.

Diaphoretics will also be found highly beneficial in some cases, especially Dovers Powder, administered at bed time. With the same intention the warm bath may be resorted to when the skin is cool, bloodless and dry. Flannel should invariably be put on. *The Diet* should be light and carefully regulated.

Local Treatment. Leeching the perineum, succeeded by fomentations, the hip-bath, enemata both cathartic and anodyne, and, in some instances, very light cauterization of the urethra, are

the remedies chiefly to be relied on under this head. It will occasionally be necessary, too, to have recourse to the catheter or bougie, after the urethral irritation has in some degree been moderated, especially if there is retention of urine. In some cases, too, I have employed the narcotized bougie with very decided benefit.

Treatment of Mixed Stricture. This variety also demands general and local treatment. The general treatment may be pretty much the same as was advised in the preceding variety.—Bloodletting, generally and locally, purging, diaphoretics, warm bath, low diet, and rest will meet the indications under this head.

Topical Treatment.—Mild soothing urethral injections, leaching the perineum, cathartic enemata; fomentations to the perineum, the hip bath, the cautery very lightly applied to the urethra; the catheter or bougie, especially if retention exists, and, if of long standing, the urethra may be very slightly scarified with the stricture knife.

Treatment of Permanent Stricture.—This variety will also demand a treatment both general and local. The General Treatment is designed to correct that feverish state, and the disturbances of the digestive function so constantly present in this variety of the stricture. In nearly every case, there is to be observed a peculiar irritative fever, attended with exalted nervous impressibility, and more or less irregularity of the digestive apparatus. In many respects the condition of the constitutional health, is closely assimilated in its phenomena, to mercurial erethismus, and certain forms of rheumatism, and neuralgia of long standing, in which the operations of the digestive system are imperfectly performed. These affections are distinguished by sudden attacks, resembling slight paroxysms of intermittent, or ephemera, ushered in by chills or a coolness, succeeded by imperfect and transitory reaction, attended with an accellerated but soft pulse; and generally succeeded by perspiration. The tongue is rarely dry or coated, and there is seldom thrist. Patients, early become pale, emaciated and feeble; and are prone to experience feelings of the most distressing melancholy and depression of spirits. With few exceptions, the appetite is impaired or exceedingly capricious; and the bowels constipated or diarrhœal. Sleep is generally imperfect, dreamy and unrefreshing. And, in some instances, a species of monomania is to be met with, especially if the patient has been labouring under the stricture for a length of time.

Under these circumstances, it would not be proper to attempt an operation for the radical cure of stricture. Before such a step is taken, a course of preparatory treatment, by the use of constitutional remedies, should generally be premised.

In treating the constitutional symptoms, which have been briefly noticed, it will generally be necessary to attend first to the condition of the digestive system. If constipation exist it will be proper to employ some mild recerning

Cathartic.—For this purpose, a few grains of calomel, or blue mass, with a grain of ipecacuanha, administered at bedtime, to be succeeded by a table spoonful of oil the next morning, will answer very well. These agents may be repeated from time to time, after proper intervals, until the symptoms ameliorate. In some cases it will be useful to employ the nitro-muriatic acid mixture, as an auxiliary means of reexciting the biliary secretion, and to maintain the solubility of the bowels after purgation. Employed internally, in doses of 7 or 8 drops three times daily, or epidermically over the region of the liver, or to the insides of the thighs. I have found this a most valuable means of regulating the bowels in these cases, after purging once or twice.

Diaphoretics will occasionally be found highly serviceable as auxiliaries to purgatives, especially, if the skin is dry; and nothing succeeds better than one grain of ipecacuanha, and three of the bi-carbonate, or nitrate of potash made into a pill, and administered once in three or four hours. Sometimes a dose of Dovers Powder taken at bed time will be useful, particularly if the patient is restless and sleeps imperfectly. In some instances I have united three or four grains of ox or swine's gall to the Dovers Powder, and found the combination a most happy one, in procuring sleep, as well as in promoting the solubility of the bowels. The warm bath may be also employed,

Bloodletting will occasionally be demanded to combat the febrile symptoms when acute, especially when the case is aggravated by catarrh; and when there is pain or tenderness about the seat of the stricture.

Diuretics will only be required, when the irritating qualities of the urine seem to aggravate the general disturbance. When to be employed none but the mildest will be allowable, and these must only be sparingly used, or they may augment the secretion of urine injuriously.

Narcotic Tonics will often prove highly beneficial, after the secretions have ameliorated, under the use of the remedies which have been considered; and no agent of this class answers better than the Wild Cherry bark—Prunus Virginiea—in the form of cold infusion. The infusion is most conveniently prepared, by suffering three gills of cold water and half an ounce of the dry bark coarsely powdered, to remain together all night, in a glass or earthen vessel; and of the infusion thus prepared, one-third may be taken before or after each meal.

The Diet should be carefully regulated. Generally, it may be moderately nourishing.

Flannel should be worn by stricture patients if the season is variable, or the weather cold.

Exercise may be indulged in with benefit, after convalescence is established, but should be moderate.

Local Treatment.—This may be *Palliative* and *Radical.*—A palliative treatment will be demanded in some cases to guard against, or to relieve certain dangerous accidents, which now and then supervene in cases of close stricture,and immediately threaten life, such as retention of urine, or violent stranguary which if not relieved might induce retention. In either case, it would be necessary to interpose the proper remedy, before operating for the radical cure of stricture. If retention exist, the catheter should be employed; and if its introduction be impracticable, puncturing the bladder must be resorted to. Stranguary may be relieved by the hip bath, demulcent drinks, bleeding, if the pulse is strong, and the circulation excited, and by revellents to the lower extremities.

Sometimes unwillingness on the part of patients to submit to the operation for a radical cure, renders a resort to the palliative treatment necessary to guard against retention of urine. In these cases the bougie must be employed merely to prevent closure of the stricture, and should be introduced on alternate days, and with gentleness.

Radical Treatment.—This consists in the division and dilitation of the strictured part, so as to restore the urethra to its proper capacity; and these ends can be most readily, safely and effectually accomplished, by the use of the Stricture Knife. Gorget and Lancet to form the sections; and Catheters and Bougies as the means of dilatation; and the mode of operating with these instruments I will next describe.

When stricture is seated anterior to the bulb, it can be divided most conveniently with the stricture knife; yet the gorget or lancet may also be employed, and will be found handy and efficient. The urethra being straight it can be readily traversed by the knife and its canula—also straight—as represented in the plate at the end of this memoir.

For the operation with the knife, the patient must be in a recumbent posture, resting on the back, and arranged in all other respects as was described for the exploration of stricture. The instrument having been adjusted, by drawing the blade within the fissure, so as to conceal the cutting edge, and there fixed with the sliding gage secured to the shank,—oiled and warmed if the season is cold—is to be carefully introduced with the right hand, while the left supports the penis somewhat extended, so as to form rather more than a right angle with the anterior wall of the abdomen. By a gentle probing movement it must then be carried along the urethra, until the probe extremity reaches the stricture, or enters it, so as to allow the shoulder of the probe to press a-

gainst the sides of the contraction. If the probe-point fails to enter the contraction, after repeated gentle trials, the instrument must be withdrawn and a smaller globe substituted, and again inserted. Should it enter upon the first trial, as will often be the case when the contraction is not very close, and the opening is in the axis of the urethra, some difficulty may arise in determining whether the globe or shoulder rests upon the stricture. In such a dilemma it is important to ascertain the precise state of the case. Generally, if a large globe has been first employed—as should always be the case—the exact depth of the stricture may be measured and noted on the canula, because the instrument will not penetrate the contraction, but merely rests upon its distal surface. By carefully comparing the depth of the stricture, when the large and small globes are used, we shall be enabled to determine whether the probe end or shoulder rests against the contraction. In many cases the probe-point is arrested by the stricture, but after varying its direction it enters it. To be well assured that the instrument has passed the contraction, it must be made to repass and re-enter the stricture several times, and generally by such manipulations, it can be determined with much certainty, not only as to the part of the instrument that is in contact with the stricture, but the degree and extent of it also.

The stricture having been penetrated with the probe point, the shoulder must now be gently pressed against the distal surface of it with the edge of the knife turned upwards. The penis must now be firmly embraced with the left hand, which also fixes the instrument in the urethra. The sliding gage can now be unscrewed and slided backwards the length of the blade, and there screwed firmly again. Directed by the operator's right hand, the knife must be pressed through the stricture by a quick motion, and instantly drawn back into the cavula. The whole instrument should now be rotated on its axis, either to the right or left, until the edge of the knife describes a segment equal to one-third of the circumference of the urethra, where the stricture must be again divided; and by a still further rotation to a like extent, a third section must be formed, taking particular care to retract the knife quickly into the canula after each section, to guard against needless wounding of the urethra. Should other strictures exist, they must be explored and divided in like manner before the instrument is withdrawn, taking care always to fix the knife as first directed, before exploration is attempted. It is my custom when more than one stricture exists, to complete their division before removing the instrument—unless patients become faint or sick—to prevent as far as possible, any difficulty in the introduction of the

tube, from infiltration and engorgement of the walls of the urethra,as well as to arrest the hœmorrhage, which sometimes is profuse. In every case, the canula armed with its knife, should be carried into the bladder so as to remove all doubt of the possible existence of other strictures. As soon as the strictures are divided the cutting instrument must be withdrawn, and a gum tube,or flexible metalic catheter, of a size to fill the urethra completely, be introduced and carried fairly into the bladder. This will put an immediate stop to the hœmorrhage. The patient may now discharge urine through the catheter, which, if it flow readily, will remove all doubt of the tube having entered the bladder. Discharging the urine, too, will wash out any blood that may have passed into the bladder. Sometimes, however, the urine does not flow through the tube, the eyes, either being blocked up with coagula of blood, or the instrument has not entered the vesical cavity; or perhaps it has been forced so far into it, as to place the eyes above the surface of the urine. Should the eyes be obstructed by coagula of blood, they must be removed, by injecting tepid or cold water through the tube into the bladder with a common penis syringe; and if the tube has not entered the bladder, or has been carried too far into its cavity, the necessary changes to give it the proper position must be made at once.

In some cases, if the division of the stricture has been imperfectly formed, considerable difficulty will attend the introduction of the tube. And if too long delayed after the division of the stricture, even when free, not a little difficulty will be experienced in the passage of the tube, by reason of thickening of the walls of the urethra, from infiltration of blood; or from capillary engorgement. Should imperfect division of the stricture cause the difficulty, the knife must be again used. In some cases I have dilated the incisions, by forcing a metalic bougie of large size through the imperfectly divided stricture, and immediately afterwards have passed in the tube without difficulty. This operation, however is hazardous, especially in the hands of inexperienced operators, and should not be inculcated as a legitimate expedient in the operation. The tube being fairly introduced, and any blood sponged away that may have been deposited on the penis and parts contiguous, it must be confined in its situation, to prevent displacement, either by connecting the free extremity of it with tufts of the tressoria, with waxed threads; or by passing the extremity through a hood, formed of cloth, with a small opening in its extremity, that embraces the penis from the free end of the glans to the mons veneris. The hood and tube may be more securely connected, by passing a few stitches through the hood, and then tieing the extre-

meties of the threads of which they are formed around the tube. A stopper should now be adapted to the tube, to prevent the accidental flow of urine. The patient may now be placed in bed, the hips resting on a folded sheet; and he may lie either on his back or side. In this condition things are to remain for several days—not less than two, unless the tube prove painfully irritating to the urethra and bladder. For 8 or 10 hours patients complain much of the irritation of the tube; but it is more from its producing a strong desire to urinate, than actual pain, that the tube becomes troublesome, which feeling, however, ultimately subsides in a great degree. It will generally be best to place a frame work or kind of canopy over the pelvis, to prevent the pressure of the bed clothes from incommoding the extended penis. Once in two or three hours, for the first day, the urine must be drawn off, by removing the stopper from the tube, placing the patient at the same time on his side, and making gentle pressure with the hand over the region of the bladder, if the urine does not flow freely. Should the presence of urine in the bladder, even in small quantity, produce pain, it must be evacuated more frequently, and after shorter intervals than just stated; and as the tolerance of the organ is recovered the intervals may be lengthened. In some cases the presence of the tube renders the bladder so morbidly sensitive, as to be incapable of bearing the smallest quantity of urine within its cavity; and if not speedily relieved, would render the premature removal of the tube necessary. To correct this state, I have used injections into the bladder, of Rice or Elm water subtepid, which can be readily introduced through the tube already in the urethra. These injections should be employed once an hour until the irritability is in a degree corrected, but they must be continued for some days, even after the tube is taken out for renewal; and it would be proper, too, for the patient to drink freely of demulcent fluids, even if no morbid irritability existed, with the design of increasing the secretion and flow of urine, to wash out coagula of blood, or pus from the vesical cavity. Should the tube, however, prove insupportably irritating, notwithstanding the use of bland injections into the bladder, it must be removed. It is important to keep the eyes of the tube open and free; and if they become obstructed, the expedient of injecting the tube with tepid water, already advised should be adopted.

In 8 or 10 hours after the completion of the operation the bowels should invariably be freely opened, either by purgative enemata, or some brisk mild internal cathartic; and the purgation must be repeated daily, for the first four days; but after that time, only to be induced on alternate days, or once in three days. Bleed

if inflammation threatens. An exceedingly light liquid diet should only be allowed, for the first week.

The meatus and glans must be frequently washed with tepid or cold water, to prevent excoriation. While the tube is used patients must lie in bed. As far as possible, the patients mind must be kept tranquil, especially for the first two or three days after the operation.

After two, three, four or five days, the tube may be removed from the urethra, but not until the urine has been discharged, and after an hour a fresh one must be introduced of the same size of that withdrawn, or even one larger may be used, if that only fills the normal portions of the canal; to be kept in one or two days, and then removed, but, as the first, not until the urine has been evacuated through it. The tube may now be withheld for three or four hours: it can then be reintroduced and kept in until next morning. After this the tube may be superceded by the metalic bougie; and for the first time since the operation, the urine may be passed after the removal of the tube. The bougie must now be introduced twice daily for ten days; afterwards it will only be necessary to use it once a day, or once in two days; and this should be kept up for six or twelve months. Indeed for years, it would be well that the bougie be introduced once a week. Generally, from ten to thirty minutes, will be long enough to suffer the bougie to remain in the urethra; and it should always be carried into the bladder.

The objects, in cautioning against passing the urine without the tube, until after its third removal, are, to guard against the scalding pain or ardor urinæ, which would certainly attend its passage before the incised structures heal over; and to prevent urinal infiltration from the incisions.

During the whole after treatment, the bowels should be kept easy and soluble.

As the strength improves, exercise can be cautiously indulged in. The diet, too, may be more nourishing. Riding on horseback, or long walks will be hurtful for months after patients seem well. The causes of catarrh, and too early indulgence in sexual intercourse, must be avoided. Alcoholic drinks and exciting condiments will be hurtful, and should not be used until all symptoms of urethritis are gone.

Operation with the Gorget.—This operation is more particularly suited to cases of stricture located behind the bulb.

Patients about to submit to the operation, must be placed in all respects, as advised in the operation with the knife. The first step to be taken, is the introduction of the *wire director* into the blad-

der, through the stricture or strictures; and its execution requires care, delicacy of manipulation, perseverance and untiring patience. The director, properly curved and oiled, should be introduced with its convexity to the symphysis, until the probe extremity has reached the bulbous portion of the urethra. It must then be gently reverted from right to left, so as to make the convexity present to the perineum. Should the stricture exist at or near the bulb, the probe point of the director, during reversion, will often force itself through the contraction at once. But when situated below the bulb, and in near proximity with the prostate, such a fortunate result is not likely to follow the first trials; but much time will be consumed before the contraction is passed. In many cases, hours will be consumed, before the stricture can be passed, during which trials I have found it necessary to vary the direction of the probe-point repeatedly, by making the reverting movements with the directing wire. In most cases, there would be little difficulty in the passage of the probe-point, did not the orifices of the lacunæ of the urethra engage it. The stricture itself, although close, seldom materially impedes the passage of the probe-point, unless a series of contractions exist in close proximity, and with openings which occupy different axes in the urethra. When the probe point is arrested in its passage, before reaching the stricture —the depth of which has been ascertained by previous sounding— it must be slightly retracted; and, after varying the direction somewhat, it can then be pushed forward again upon the stricture, but with very little force; and these evolutions, should be repeated again and again, until the stricture or strictures are reached, and passed, which will be announced by the smooth, continuous, and uninterrupted passage of the director into the bladder. The manipulations in the execution of this step, should be delicate and gentle, or needless laceration of the mucous membrane of the urethra may follow; nay even the walls of the canal might be transfixed if they are rudely performed. Perhaps no operation in surgery, requires more delicacy, caution and deliberation than this; and while I would inculcate the precept of gentleness and care, I must not omit to urge the equally important one of perseverance, to render it successful. Hours may be consumed before the director enters the strictures and bladder; but the time will be of little importance, if gentleness tempers the trials, even if a failure results, as the patient will have suffered little if any pain or lesion of the urethra. In many cases I have continued my efforts four hours, and finally succeeded when I least expected it.

After the director enters the bladder, it must be gently rotated from side to side, with a probing, searching motion, as in sounding

the bladder for stone, to determine if its motions are free, such as might be expected to take place in a cavity like the bladder; or restricted, which would be the case if the instrument had formed and entered an abnormal or accidental passage. The importance of these directions will be apparent, when it is remarked, that they are designed to guard against the wounding of important parts, not necessarily involved in the operation for stricture. As the director is to guide the course of the gorget, it is manifest, that too much caution cannot be observed in giving it the proper direction into the bladder.

The director, after entering the bladder, must be made to project fully three or four inches into its cavity, to prevent accidental displacement during the sequel of the operation.

The penis must now be grasped with the operators' left hand and held nearly erect, while the thumb projecting beyond the glans, presses the director firmly against the side of the index finger, so as to fix the instrument. In grasping and fixing the penis, and director, as just described, it is important not to extend the penis much, as the director might be drawn from the bladder.

The free extremity of the director, may now be taken hold of, and supported by an assistant. The operator next takes hold of the gorget previously oiled, and directed with his right hand, enters the extremity of the director into the perforation at the truncated end of the cone, and slides it carefully down to the glans, and a few lines within the meatus. The penis and director must now be inclined forwards, still held by the left hand of the operator, until it forms an obtuse angle with the anterior wall of the abdomen. As soon now, as the end of the director projects far enough beyond the handle-extremity of the gorget, it must be bent and taken hold of by the assisstant, who, either rests his elbows on his knees; or the hand may be supported by a short staff resting on the bed between the patient's thighs, so as to fix it steadily. The operator holding the handle of the gorget with his right hand,—having carefully disposed the blades so that one shall correspond with the septum of the corpora cavenosa, and the other two with the sides of the urethra,—he now gently and slowly depresses the cone of the gorget along the wire director, down to, and through the stricture or strictures, by a firm steady movement, until it enters the bladder, which will generally be announced by a sudden start of the instrument. In some cases, too, there will be an escape of urine through the canula of the gorget, as the bladder is entered by it.

It is best in all cases, that the gorget should be urged into the bladder, even if only a single stricture exist; as it renders any

farther exploration needless; and it inflicts little if any suffering, as the cutting edges of the blades are not keen enough to wound the mucous membrane of the urethra when no stricture exists.

The gorget may now be withdrawn, with or without the director, as may seem best. If there is reason to fear the stricture has not been divided with sufficient freedom, the gorget may be withdrawn without the director, and a larger gorget used before removing it from the urethra and bladder, according to the direction already given.

In selecting the gorget, it is important that it fill the orifice at the meatus, but not completely. If too small the stricture will not be sufficiently divided; and if larger than necessary, the blades might lay open the walls of the urethra, and give rise to serious consequences from urinal infiltrations, or hœmorrhage. In ordinary examples of close stricture of long standing, it will generally be best to employ several sizes, as well as to use those having pretty keen blades; and always to begin the operation with one of small size. In these cases the strictured parts are firm and dense, and cannot be readily divided, unless the blades of the gorget are keen, and penetrate the contraction fairly before they begin to cut. It would be convenient to have several sizes of cones to screw on to the same shank, and such is the plan I have adopted.

The after treatment in all respects must be the same, as that pointed out somewhat in detail in the operation with the knife, and need not be repeated here.

Operation with the Lancet. This mode of operating is more particularly adapted to cases of very close stricture, and of long continuance, in which the strictured textures have acquired tough, dense characters. In these examples it would be difficult to employ even the smallest gorget, as its truncated extremity, or apex, would be liable to engage the margin of the opening of the strictures, without penetrating it.

The operation with the lancet, differs from that with the gorget only, in using a concealed lancet and canula with the wire director.

The first step in this operation, is the introduction of the wire director through the stricture into the bladder, and is to be executed as already described. Then the canula, with its concealed lancet must be connected with the director—having been previously oiled—by passing the free end of the wire into the opening at the lancet extremity of the canula, and sliding the canula along the director, until it enters the meatus. As soon as the ex-

tremity of the director presents beyond the handle end of the canula, it must be taken hold of by an assistant, and bent, as was directed in the gorget operation. The handle of the lancet must now be connected with the shank, and fastened with the side screw. The penis held, as in the operation with the gorget, as well as the free end of the director, the operator then grasps the handle of the canula with his right hand, in such a manner, as to enable him to fix the handle of the lancet with the thumb and index finger. He now steadily slides the lancet extremity of the canula down to the stricture, against which it is made to press firmly. The lancet is then protruded, by pressing its handle downwards with the thumb and index finger quite to the handle extremity of the canula. The lancet must now be retracted within the canula, and the canula again pressed onward upon the stricture. Here the lancet should be pressed into the stricture a second time; and these manipulations must be repeated until the stricture or strictures are divided, and the canula made to enter the vesical cavity. The lancet employed in this operation may be of sufficient width to divide the stricture completely; or it can be used merely preparatory to the gorget. In either case, it will be found a most handy and efficient instrument, and perfectly safe. In close and dense strictures, we are enabled by this operation to incise them most conveniently. Indeed, in the present state of our knowledge, it is the only operation, as far as my observation and reading extend, which will enable us to divide such strictures with safety and certainty.

In some cases of very close stricture, to incise them effectually, without using the gorget, or a very wide lancet, I have passed a lancet of moderate width through the stricture several times, taking care to vary the situation of the cutting edges, so as to divide the contraction in many different places.

In certain cases of close stricture, rendered impervious by the existence of several contractions situated in near proximity, with their orifices in different axes of the urethra with respect to each other, and of tough and dense characters, the lancet may be used without the director. In these examples, it would be exceedingly difficult, if not impracticable, to penetrate the contractions with sounds, directors or bougies. The first stricture might be gained; but the second, which possibly opened on the opposite side of the urethra, would elude the searching extremity of the director; and if more than two existed their orifices too might be equally variant, so as to render it difficult, if not impracticable to pass them as already remarked. I have met with, and treated several cases of this description of stricture, which I never could penetrate; but

I finally succeeded in curing them by the use of the lancet. The operation with this instrument is simple, yet it is fraught with danger, by reason of the liability of the lancet to pursue a wrong direction, and it might lead the operator to form openings from the urethra into the contiguous structures, which would hardly fail to produce urinal infiltrations. For the operation, the patient must be placed as already described in the operation with the gorget. The instrument, adjusted as already described, and oiled, is to be entered and carried fairly down to the stricture. In this situation, holding the penis firmly with the left hand, and elevated at an obtuse angle with the front wall of the abdomen, the lancet porte must be pressed against the contraction with the right in the axis of the urethra, while the handle of the lancet is pressed forward with the thumb and index finger into the stricture, with its cutting edges presenting to the sides. The lancet must be instantly retracted, and the porte or canula again pressed onward, so as to fill the incision just formed, and the lancet be made to protrude a second time. In this manner the operation is to be continued, until the strictures are divided, and the canula made to enter the bladder. It will be necessary in directing the lancet through the stricture, whether operating in the spongy, or bulbo-vesical portions of the urethra, to direct its point carefully in the axis of the canal. In the spongy part it will be an easy matter to pass the lancet in the axis of the urethra; but in the bulbo-vesical portion it will always be attended with more or less difficulty; and if the operator is rusty in his knowledge of the anatomy of the parts, the difficulties will be greatly increased, to say nothing of the dangers. While incising the contractions of the bulbo-vesical portion of the urethra, the canula should always be recurved somewhat, by pressing the lancet extremity more firmly against the stricture; and the recurvation must invariably be towards the perineum. In the spongy portion the canula must be kept as straight as possible, until it arrives very near the bulb. As soon as the bladder is gained, the canula should be withdrawn, and the urethra instantly filled with a tube of proper size; and the case then is to be managed, as already described in the after treatment, when the knife is used.

This operation is also well adapted to the treatment of impervious stricture, attended with retention of urine; and it may supercede the operations ordinarily resorted to for puncturing the bladder in retention. I have resorted to it in several cases of impenetrable stricture, as well as of protracted retention of urine, with complete success, and feel justified in recommending its adoption in similar cases. The operations which have been des-

cribed, are very nearly equally adapted to the treatment of the different forms of stricture of simple character, no matter where situated in the urethra. Even in complicated examples, they will be found, in most instances, to furnish the best means of cure, if a proper auxilary treatment of the complications is pursued.

The only forms of pervious stricture, for the treatment of which the gorget is inappliable, are the more delicate examples of the bridle variety. In these the stricture knife must invariably be preferred, as it will enable the operator to incise the delicate structures of which they consist, with greater precision, than could possibly be done with the gorget. The knife, too, will be best suited to strictures of unequal surface, as ascertained by exploring with the waxen bougie, from the precision with which its cutting edge can be applied to a particular part of the contraction, without the least danger of wounding any other; and from being able to form the sections where required with it, and lightly, or otherwise as may be necessary.

The treatment of organic stricture, of long standing, especially those forms distinguished by decided induration of the strcutures immediately involved, by incision and dilatation, more certainly changes the pathological conditions of the walls of the urethra, than any other plan practiced at the present day. Indeed, no other method now in use, is calculated to reconvert the diseased urethra into a healthy organ. Could pressure be sufficiently and steadily employed, it might, as in other parts of the body, correct and remove the thickened, and indurated conditions of the mucous and submucous textures of the urethra, upon which this variety of stricture depends. But, from the situation of these structures, this valuable therapeutic agent cannot be properly applied, and hence it is, that the treatment by dilatation only, as generally used by surgeons at the present day, seldom if ever effects more than mere paliation of permanent stricture. Dilatation often restores the urethral passage to something like its normal size, and the amelioration, too, has in some instances continued for a length of time. But sooner or later, the stricture is renewed, and merely because the mucous and submucous textures of the urethra, had never parted with their morbid conditions entirely. In these cases, dilatation only forces open the contracted urethra mechanically, without causing the reabsorption of the lymph, which had been effused into the mucous and submucous textures in the causation of the stricture. Even after long continued dilatation of the urethral passage, its walls pretty constantly resume their contracted state, after the dilating means are entirely laid aside. Such

returns of the stricture, however, are not always the immediate result of the discontinuance of the dilatation. In most cases they are gradual and slow in their return, though in some instances, they promptly reappear.

Incisions, formed in indurated structures, if kept from reuniting by adhesion, until they granulate and suppurate, tend to widen the contracted parts of the urethra, while the suppuration, and pressure of the dilating tube, or bougie, greatly promote the reabsorption of the effused and organized lymph, constituting the induration. There is no disposition of the urethra, to contract its caliber after being incised, if there is no loss of substance; and the fears entertained to the contrary are groundless. It is true the incision formed in the membranous part of the urethra in lithotomy, is sometimes followed by contraction of that part of the canal. The contraction in this case, however, is the result of occasional sloughing taking place on the margins of the incision, induced by the extracting efforts, and not by the incision. Any loss of substance from the mucous lining of the urethra, or from the walls exterior to it, whether from the improper use of the nitrate of silver, or from ulceration, would generally be followed by more or less contraction of the canal. While wounds with loss of substance tend to contract the urethra in greater or less degrees; those, without such loss, as uniformly widen it, especially if they heal by the second intention, as will invariably be the case in the urethra, subjected, as it necessarily is, to frequent disturbance, both from the bougie, and from urining, during the after treatment of stricture.

A strictured urethra, restored to its normal capacity, by the modes of treatment I have been describing, is not more liable to a return of the contraction, than any other portion of the canal which had not been its seat: provided the canal is daily dilated, until all inflamatory induration, and tenderness of the affected parts are entirely gone.

Complications of Stricture. Pouchy Dilatations posterior to the seat of stricture, occasionly complicate permanent stricture, and when extensive, a particular treetment will be demanded. These dilatations may be known to exist when involuntary dribbling follows urination, especially if it take place some minutes after, and in considerable quantity. A close stricture, complicated with a pouch, or pouches, may be cured without materially affecting the pouch: and although the water flows in a pretty bold stream, urining will uniformly be followed by the troublesome and disgusting accident of involuntary dribbling.

These pouches are always to be met with on the inferior surface of the urethra; and in a majority of cases will be situated in

the bulbo-vesical portion of the canal, though they occasionally exist in the spongy portion likewise. In treating them, it will be proper to divide the stricture first, either with the knife, lancet, or gorget, as already described. The cutting instrument must then be withdrawn, leaving the director in the passage if the lancet or gorget is employed; and if the knife is used, the director should be introduced quite into the bladder, after that instrument is removed. The director may then be carefully retracted from the bladder, and as its probe point glides along the urethra, with the convexity directed to the symplisis, it must be pressed into the pouch, which, generally, will be indicated by its sudden spring forward along the urethra, as the probe extremity enters it. The probe extremity being fairly in the pouch, it must be made to rub and irritate the mucous lining of that cavity, by retracting, rotating, and by a rotary movement of its extremity, to be continued for some minutes. The director may now be withdrawn and a suitable tube introduced, the case then to be managed as in simple stricture, only, that the urine must not be allowed to flow along the urethra, or around the tube, until the pouch may be supposed to be entirely obliterated; which will generally be the case in three weeks, if the mucous lining was sufficiently irritated with the director. Should more than one pouch exist, which will sometimes be the case, they must be irritated as the first, before withdrawing the director.

False Passage. This occasionally occurs as a complication of permanent stricture, but it is invariably the result of rude efforts to pass the contraction with sounds or bougies. In some cases the false passage is extensive; but generally it is limited, and of moderate caliber; and seldom subjects patients to suffering or inconvenience, after the inflamation subsides, usually following the accident which produces it.

This complication is always exceedingly perplexing, both in exploring and treating stricture, by reason of the difficulties it causes in efforts to gain the contraction, as well as in distinguishing the false from the true passage. In the cases which have passed under my treatment, the abnormal passages were situated under the urethra, and great difficulty was experienced in determining the precise seats of the strictures, or the commencement of the false passages, as no impediment in the progress of the sound was experienced, until its probe-extremity was arrested by the cul de sac of the abnormal passage, and, after operating for their cure, I was fully convinced that no exploring trials, could have enabled me to gain the orifice of the stricture, unless by the merest accident. Should the orifice of the stricture be gained, by the probe end of

the director—the instrument always to be employed in suspected cases of this complication,—the operation might then be performed with the lancet, or gorget as already described. Generally, however, so fortunate an event is not likely to occur, and, the operation I have termed *Raphco-Urethral*, will become necessary. For this operation the patient must be placed in the position as for lithotomy; or he may lean upon the end of a table of proper height, covered with folded blankets. The position on the back, however, is the most favorable. The perineum must be shaved and washed. A common female sound, with a fissure, or deep groove extending fully an inch from its extremity, may now be cautiously entered at the meatus, oiled, and warmed if necessary, and carried gently down as far as it can be introduced, with the convexity presenting to the perineum, and with a probing motion. As soon as the end reaches the bottom of the passage, the instrument must be reverted, so that the convexity shall look to the symphisis. The extremity of the instrument must now be made to present in the perineum along the rapheal line, and securely and steadily held in that position by an assistant. The operator now cuts boldly upon the presenting extremity of the sound, or, as it should now be denominated, director, so adapting the scalpel, that its cutting edge shall be applied to the raphe, and to cut fairly into the fissure or groove of the director. Generally, the first incision should not exceed an inch in length. The wound must now be sponged clean, and as the director is withdrawn a few lines—merely to expose the bottom of the passage—this last named part should be carefully explored with the end of a delicate probe, in search for the orifice of the stricture. In most cases it will be necessary to dilate the wound with hooks or curved spatula, the more completely to bring the cavity into view. If the orifice is not discovered, the incision must be lengthened a few lines towards the glans, and the director still farther withdrawn; after which the cavity is to be again explored with the probe in search of the orifice. To prevent needless section of the urethra, as the false passage is laid open, I have usually desired patients, from time to time, as the operation progresses, to pass a few drops of urine to indicate the precise seat of the orifice; and it will be found an excellent expedient, as the issue of the urine shows at once the situation of the stricture. As soon as the orifice is discovered, and without making any farther section of the urethra, it must be incised in several places with a straight grooved director, and a narrow sharp pointed straight bistoury. Or the wire director and lancet, or gorget may be used. I have employed the bistoury and gorget in this operation indiscriminately; but there

are cases in which each will be preferable. When false passage occurs near the bladder, the grooved director and bistoury should be preferred, as, in most cases, only one stricture exists, and the bistoury will enable us to divide it readily and effectually. But if the false passage is situated anterior to the prostatic portion of the urethra, several other strictures may exist at the same time, below or above it; and to enable us to divide them, the wire director and lancet, or gorget must be preferred. In using the wire director and lancet, or gorget, it will only be necessary to enter the director at the meatus, and carry it along the urethra, and through the orifice of the stricture, now exposed in the distal angle of the wound. Should other strictures exist anterior to the one exposed by the wound, they, of course, must bep assed before the probe-end can reach that stricture. The director in every case must be carried fairly into the bladder; and the division of the stricture accomplished as already particularly described. As soon as the stricture or strictures are divided, a tube of proper size must be introduced from the meatus through them into the bladder. To prevent the eyed extremity of the tube taking an outward direction into the wound, the extremity of the finger must be placed over or against the orifice, as it passes along the urethra, near the orifice of the stricture, so as to force it back. The wound must now be sponged out carefully, and closed with a sufficient number of points of the interrupted suture, deeply inserted into the wound, and beyond its margins. Generally, it will be found most convenient to enter the suturising needle from within outwardly, and from the bottom of the wound. In one of my cases I employed the leaden wire suture, instead of the thread or silken, and found it to answer a most valuable purpose, by enabling me from day to day to tighten the grasp of the noose, by twisting the free ends together. Adhesive straps may next be placed between the sutures, supported by a compress and T bandage. The tube must be confined in the urethra and bladder, as was advised in the operations for simple stricture; and in all respects, the case is to be managed nearly as directed under that head, for the first three or four days. The patient must be kept perfectly still; and it would not be amiss to have the knees tied together during the whole after treatment, especially if he is restless. It will not be proper to purge during the first four or five days, or even later, if it can be avoided; and this is the only part of the after treatment, differing materially from that advised in simple stricture, except the management of the wound. The lancet must take the place of purgatives, and should be early and decisively employed if inflammation threatens. Should the parts involved in the operation, in-

flame to a considerable extent, especially those in which the perineo-urethral incision is formed,—adhesion would be prevented. And if the bladder and peritoneum are menaced, there would be danger to life, should the inflammation run high. In these circumstances, the lancet must be used promptly and decisively, as already remarked; and the bleeding should be repeated until the inflammation is subdued.

These remarks are applicable to the treatment of each of the varieties of stricture, in the traumatic stage. As yet, however, I have never been compelled to resort to it in but two cases. I have only lost one patient out of the large number treated, and he died of Catarrhal inflammation chiefly.

Every straining exertion, either in efforts at dejection or urination, must be carefully guarded against. The tube should be examined frequently, and kept open. The urine must not be allowed to accumulate in the bladder in any considerable quantity, until the external wound heals up.

After three, four, or five days the tube may be removed; and this must be done in the gentlest manner, more especially if it is much softened by the secretions of the urethra; or it may be parted and a portion left in the bladder. The wound can now be examined, and if leaden sutures have been employed, they must be tightened by twisting their ends together if necessary. Fresh adhesive straps may be applied also if required, and the compress and T bandage again applied. A fresh tube will be required, and for the first time must be introduced in the course of an hour after the removal of the original one. The introduction of the tube requires much care to prevent its eye-extremety taking a direction into the wound. To guard against such an accident, the tube, before it is introduced at the meatus, must be slightly curved near its eyes; and it should always be supported with the wire, taking care, as it traverses the urethra, near the wound, to keep the extremity pressing against the superior portion of the canal. Some pressure may be made at the same time upon the external wound, by placing the extremities of the fingers on the dressing, so as to make them compress the parts beneath more firmly. After reaching the bladder the tube must be adjusted as in the first instance, and should not be disturbed for three or four days. After this it may be taken out daily, or once in two days. It is important that urine shall not be discharged through the urethra, without the tube, until the wound heals up. In eight or ten days the sutures may be cut away. It is best that patients lie in bed during the healing of the external wound, and live very light. Upon this plan I have successfully treated five cases of this com-

plication; and though the division of the strictured parts with the lancet and gorget is peculiar to myself, the operation is truly Mr. John Hunters in principle.

Fistula in Perineo.—The treatment of this complication of stricture, differs from that of the forms already considered, chiefly in the medication of the attendant fistulæ. The strictures themselves are to be divided with the knife, gorget, or lancet, as may seem best, and, as already described, as the first step in the operation. The fistulæ, and their corresponding sinuses, are then to be carefully explored with long delicate eyed probes; and as they are ferretted out and traced to their terminations, the respective tracts must be filled with setons of proper size, and drawn through with the probes. When numerous orifices exist, the operation will be tedious and difficult. In some cases several setons will occupy the same common fistulous opening. Occasionally these sinuses communicate with the rectum.

After the setons are introduced, they must be secured so as to prevent their premature displacement; and they must continue in the sinuses and fistulæ until free suppuration is induced. After this, it will be necessary gradually to reduce them; and from day to day the reduction must be continued, until the sinuses are so much diminished in size as to heal readily; at which time the setons may be removed, and pressure made over the perineum with compresses supported by the T bandage. For setons the best material is cotton yarn, formed into cords of proper sizes. Thus formed they can be readily reduced by taking one or more threads away at a time, without removing the cord itself.

During this treatment, tubes must be kept constantly in the urethra and bladder; and, as the passage of urine through the sinuses would tend to prevent their obliteration, the utmost care will be required to prevent its escape around the tube, until they heal up.

This mode of treating stricture complicated with fistulæ of the perineum, has been practised by me in some exceedingly unpromising cases, and with complete success. One of them was distinguished by seven distinct fistulæ, through which the urine gushed during urination, like so many streams from the rose of a watering pot, and it had existed for many years.

Pressure will sometimes succeed in recent cases, if effectually employed over the seats of the sinuses. To be successful it must be perseveringly continued for a lengthened period. Incision, too, may be resorted to in cases of superficial sinuses, but it is a severe and hazardous expedient, and will seldom be justifiable.

Irritating injections may likewise be resorted to, and I have employed them when the seton could not be used with safety, and when incision would have been too hazardous.

Enlarged Prostate.—When this complication occurs with young subjects, it must be treated by general and local bleeding over the perineum, and the prostate itself by leeching through the rectum; by low diet, purging, and by mercury and iodine employed as internal remedies. It is important, too, that rest be enjoined during the treatment. If the presence of the tube, in the urethra and bladder, seems to irritate the prostatic affection, it must be dispensed with, as soon as the incisions of the strictured parts heal over. In some bad cases I have succeeded in relieving both strictures and enlarged prostate, by continuing the tube in the urethra and bladder during the treatment, as in ordinary simple cases. With aged persons, although there is no good reason to hope for a cure, much relief may nevertheless be afforded, by leeching the prostate through the rectum, by scarifications of the gland through the urethra with the stricture knife, and by the use of iodine, internally taken. The bleeding of the gland by incisions, tends decidedly to reduce it; and a sorbefacient effect seems to follow the suppuration, which always takes place in the incisions. Generally the best directed treatment is only palliative.

Hæmorrhois.—This troublesome affection now and then complicates stricture, and it greatly augments the suffering of the patient, especially of the stricture is close. It also tends to aggravate the stricture, by the constant irritation kept up by it in the rectum. Whether the product, or accidental concomitant of stricture, it must claim attention during the treatment of it. Fomentations with, or without leeching the parts, may be employed if the tumors are painful. Emolients, saturnine or cold water injections into the rectum, and pounded ice applied in bladders may also be beneficially used. A soluble state of the bowels is of the utmost importance in the treatment. Rest in bed, too, will be found highly beneficial. And a restricted laxative diet should be invariably enjoined.

Prolapsus Ani.—It is not common to meet with this complication, but it occasionally occurs, and never fails to augment the patient's suffering, as well as the difficulties in treating stricture. Like hæmorrhois, it tends to aggravate the stricture, and on that account, if for no other reason, it should claim early attention.

If the prolapsus be considerable, and of some continuance and painful, fomentation should be freely used to the protruded parts, until relief is obtained. As soon as the protruded parts become less tumid, painful and tender, they may be returned by the taxis carefully used; and then to be supported by a soft compress and T bandage; while the patient must be confined in bed with the hips somewhat elevated. This treatment will be most applicable

to cases of recent prolapsus; and it will generally prove successful, if the bowels are kept soluble at the same time that the fomentations are employed.

Prolapsus should generally be relieved before the operation for stricture is attempted; but if necessary, by reason of any urgent danger, threatening from the stricture, it can be treated at the same time.

Hernia Humoralis.—This complication may occur with the stricture, or be its product. Stricture of the urethra in the immediate vicinity of the prostate, is prone to produce this complication. It is generally a painful affection, and should always lead to the postponement of the operation for stricture until relieved. Indeed, if the operation for the radical cure of the stricture should be attempted, before correcting this affection, there would be great danger of producing disorganization of the inflamed testis; and the operation would in all probability fail, because few patients could submit to the necessary confinement, while laboring under such a painful disease.

In treating it, general and local bleeding will be required. Active purging will also be highly necessary, especially if made to produce emetico-cathartic effects. Fomentations or cataplasus, cold applications, especially pounded ice applied in wet bladders may, in their proper places, be used with great benefit. Patients should be confined to bed; the testis must be suspended; and an exceedingly low diet enjoined.

Generally, it will be unsafe to operate for stricture under four or five weeks, after the hernia humaralis subsides. And even at that late period, there would be danger of reexciting the orchitis.

Impairment of the Erectile Power, and Sexual Appetency, occasionally complicates stricture, or follows upon its treatment after the operation. It is by no means uncommon for the erections to become defective during the continuance of stricture; and we often find that there is a corresponding decay of the sexual desire. These unfortunate conditions, however, are generally relieved by the cure of the stricture; and require no specific treatment, unless they continue after the perfect cure of stricture. Should they persist after the urethra has parted with its irritation, consequent upon the treatment of stricture; and after the general health has improved decidedly, there would be good reason to suspect the existence of prostatic irritation,—Morbus Lallemandi, —or seminal debility as their causes, for which the cautery should be employed.

Other complications might be considered, as several of them occasionally occur; but as this paper is only designed for the consi-

deration of stricture, and its treatment more properly, they need not be particularly noticed.

Relapse of Stricture.—When permanent stricture has been properly treated for the radical cure, there will be little danger of relapse, unless patients too early discontinue the use of the bougie; or prematurely return to free habits of living, imprudent exercise, or sexual intercourse. I can conceive, however, that relapse might take place in cases of long standing, and when the structures were extensively and profoundly implicated. In such examples, it would be difficult to determine with certainty, when the cure was completed, as would also be the case in those of milder characters; and though the caliber of the urethra, and its elasticity, should be greatly improved, nay apparently normal, there might still be a lurking irritation of the structures, or even a pathalogical condition, which could not fail to subject the patient to a recurrence of the stricture, from the operation of any of the exciting causes already enumerated. But, after the walls of the urethra have completely resumed their normal conditions in all respects, and have been confirmed in their recovery, I cannot suppose they would be more liable to a recurrence of stricture than any other part of the canal. When relapse takes place, it must either be the result of the too early discontinuance of the bougie, or of indiscretion in the use of food, drinks, exercise, &c. and not from an inherent and abiding disposition of the walls of the urethra to become again diseased.

In conclusion, the bougie will be required as long as there is reason to suppose the strictured parts may be the seat of a lurking irritation; and as long as the muco-purulent discharge continues, which generally accompanies stricture, such irritation may be supposed to exist. If, however, there is good reason to suspect the discharge results from the irritation of the bougie, its use must be suspended,—for a while at least; or only be used occasionally, and after long intervals. In every case I have treated, the discharge ceased with the evanescence of the irritation of stricture. Persons having been affected with stricture, are subject, for a long time after recovery, to mucous discharges from the urethra if they indulge in any excess. Sexual intercourse, a debauch, or a hard ride on horse back, are very liable to cause such a discharge to take place. When it follows coitus persons are disposed to ascribe the discharge to gonorrhœal irritation. The benign character of it, however, will soon be declared by its spontaneous cure, or from the use of mild remedies, or restrictions on diet. In these cases there is seldom any disposition in the urethra to become strictured again, unless the irritation is frequently renewed, or imperfectly or badly treated.

EXPLANATION OF THE PLATES.

Explanation of Plate 1st.

Fig. 1. Ring-handle of stricture sound of proper size. B. Connecting screw of handle. C. Sliding gauge. D. Thumb-screw. E. Shaft of sound. F. Globe. G. Connecting screw. H. I. J. K. Balls of various sizes. Whole instrument 13 inches in length.

Fig. 2. A. Wire-director to be 23 inches in length, and here represented of the proper size as the largest one. B. The globe-extremity.

Fig. 3. A. Wire-director of smallest size, to be of same length of Fig. 2.

Explanation of Plate 2d.

Fig. 1. A. Canula of Stricture knife, 12 inches in length, and of proper size. B. Handle. C. Shoulder. D. Fissure. E. Probe. F. Globe connected with probe by screw.

Fig. 1. G. Knife. H. Handle. I. Sliding gauge. J. Thumb-screw. K. Knife 12 inches in length :—the whole instrument to be 15 inches in length from end to end.

Fig. 2. A. Stricture-gorget, of proper size and length, to be not less than 10 inches from end to end. A, also represents the inflexible portion of the canula of the gorget, to be 8 inches in length. B. Spiral or flexible portion, 3½ inches in length. C. Blade of gorget. D. End of one blade. E. Inflexible part of canula, six lines in length, containing female screw for receiving male screw of gorget. F. Handle-extremity of canula. G. Orifice for entering wire director.

Fig. 3. Stricture lancet. A. Inflexible portion of canula, to be not less than 7½ inches in length. B. Flexible or spiral portion of canula, to be 3½ inches in length. C. Inflexible part of lancet extremity of canula, to be 12 lines in length. D. Orifice and fissure for wire-director and lancet. E. Handle-extremity of canula.

Fig. 4. Stricture lancet. F. Wire-shank of lancet. G. Lancet 8 lines in length. H. Handle-extremity of wire-shank : this to be 13 inches in length, from end to end.

Fig. 5. Handle of lancet wire-shank. I. Handle. J. Thumb-screw. K. Orifice to receive extremity of lancet wire-shank.

Fig. 6. Flexible metalic catheter. A. Inflexible portion of catheter, not less than 8 inches in length. B. Flexible or spiral portion, not less than 3½ inches in length. C. Inflexible portion at entering extremity, 8 lines in length. D. Eye of catheter. E. Handle extremity.

ERRATA.

Page 14, line 10th from top, for spougiosum, read spongiosum. Same page line 11th for valvalor, read valvular. Same page line 11th from bottom for impernicious, read impervious.

Page 24, line 4th from top, for recerning, read secerning. Same page, line 11th from bottom, for Virginiea, read Virginiana.

Page 26, line 14th from bottom, for cavula, lead canula.

Page 36, line 12th from bottom, for Panchy, read Pouchy.

Page 42, line 10th from top, for Hœmorrhais, read Hæmorrhois. Same page, line 9th from bottom, for hœmorrhais, read hæmorrhois.

Page 45, Plate 2nd, Fig. 1, for 12 inches read 12 lines.

Plate I.

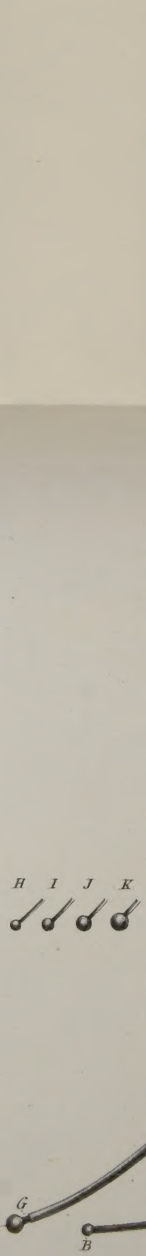

Fig. 1.

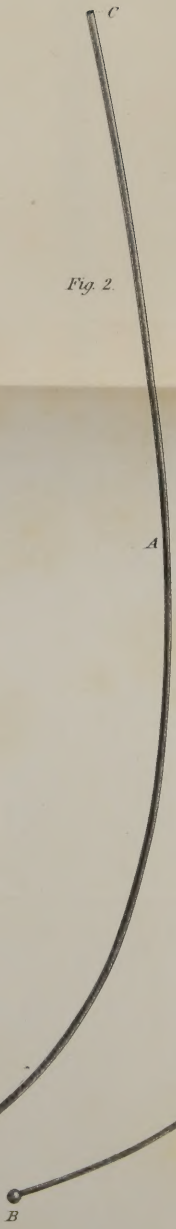

Fig. 2.

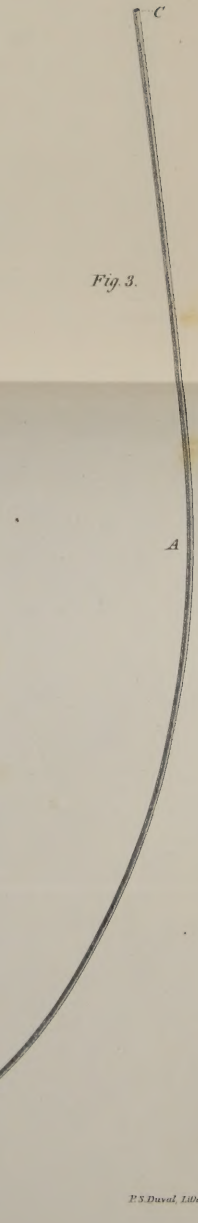

Fig. 3.

P.S.Duval, Lith. Phil.

Plate II.

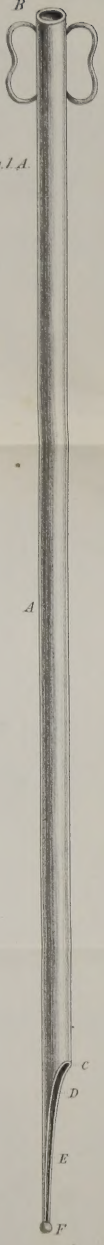

Fig. 1 A.

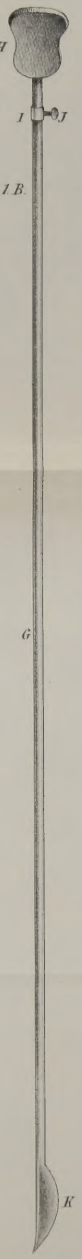

Fig. 1 B.

Fig. 2.

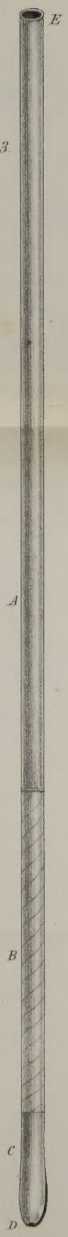

Fig. 3.

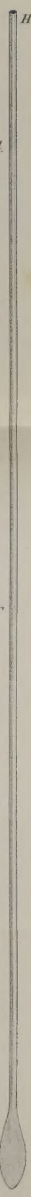

Fig. 4.

Fig. 5.

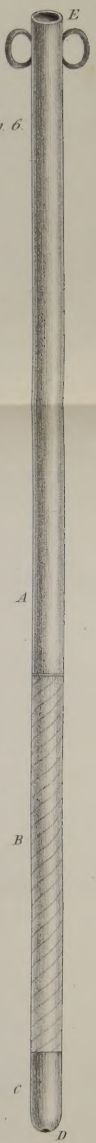

Fig. 6.